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**A device for mounting a gutter on a building and method for mounting the device**

The invention relates to a device for mounting a gutter on a building and comprising at least one rail mounted on the wall or fascia and extending in a mainly horizontally extending direction, and a number of gutter brackets located at a distance from each other and made of e.g. strip iron and each having a first section for fixing the gutter bracket on the rail and a mainly arcuate second section for supporting the gutter.

Usually, gutters are mounted by means of a number of gutter brackets fixed to the building and having a shape substantially depending on the design of the base of the roof.

Conventionally, the gutter brackets are screwed directly on e.g. a canting strip or fascia board which is part of the base of the roof.

20

In order to be able to position and support the gutter properly, it is therefore necessary to make a careful measurement and marking of the location of each individual gutter bracket before it is screwed on said board in which holes for the screws which are to be used to fix the gutter brackets furthermore often have to be predrilled. Such a mounting is time consuming and therefore expensive.

A replacement will furthermore leave disfiguring screw holes in the fascia board, and it can be difficult to unscrew the gutter bracket without removing large parts of the gutter.

Therefore, there is a need for a gutter bracket which can be mounted on a base of a roof more easily and quicker than hitherto known and which can be dismounted and replaced by a new gutter bracket in a simple manner.

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A rainwater drainage system is known from European Patent EP 0511758 B1. Said system comprises a gutter which is clamped on a rail which has been fixed on the fascia board first. The associated polyester-coated, extruded, aluminium gutter is provided with integrated gripping means in form of an upper lip and a lower lip for engaging opposite gripping means on the rail. A gutter designed in such a way cannot be supported by conventional gutter brackets and is therefore expensive, and the relatively fragile gripping means are exposed to a large pressure when the gutter is loaded and weighed down by e.g. snow, water and fallen leaves.

Such a loading can therefore result in gradual or permanent deformation of the entire structure with the consequent risk of gutter and rail being forced out of engagement in places where the load is especially great. Therefore, areas where gutter and rail do not close completely tightly can be caused. In such places, precipitation cannot be carried off via the gutter but can instead pass freely and thereby cause water damages on brickwork and timber which gradually will be damaged beyond repair by damp and rot.

The object of the present invention is to provide a device of the kind mentioned in the opening paragraph by means of which the above-mentioned disadvantages and drawbacks can be remedied.

Another object of the invention is to provide a device by means of which it is possible to mount a gutter on the base of the roof of a building quickly and easily without using extra tools for securing the gutter during mounting.

The novel and unique features according to the invention, whereby this is achieved, is the fact that the rail has an inside face facing the wall, an outside face facing the first section of the gutter brackets, an upper side having an upper

longitudinal groove, and that the first section of the gutter brackets each are provided with means for detachably engaging the grooves of the rail.

5 In gutter brackets mounted in this way, a gutter can advantageously be detachably placed, which is especially advantageously when the gutter is made of metal such as e.g. zinc, copper or aluminium, as metal keep expanding depending on changes in temperature.

10

The rail according to the invention furthermore makes it possible to secure the first sections of a suitable number of gutter brackets on the rail so that all gutter brackets are hanging at exactly the same distance from the upper edge of  
15 the rail. Thereby, a very stable support for the gutter is created.

The means for detachably engaging the grooves of the respective gutter brackets comprise a hook designed at the top  
20 of the first section of each gutter bracket and engaging with the upper groove of the rail. By means of this hook, all necessary gutter brackets can initially be hanged and distributed on the rail without the gutter fitter needing additional means to secure the gutter bracket.

25

When the upper groove of the rail has form of a face forming an acute angle with the outside face of the rail, the gutter brackets can be positioned on the rail in an especially easy manner, and they will be able to hang of themselves until the  
30 gutter fitter finally decides to fasten them. Thereby, the gutter fitter is able to make a final estimation of the required number of gutter brackets and possibly distribute them differently so that they for example are located closer to each other in areas of greater load.

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When the gutter fitter at mounting is to fix the gutter brackets onto the rail, this can be done in one single step in which at least one screw nut on said first section is engaging with the lower groove in the rail. The nut is tightened easily  
5 and securely against the gutter bracket by means of an associated screw such as a Torx or Allen screw.

In a preferred embodiment of the invention, the lower groove has form of a face forming an acute angle with the outside  
10 face of the rail. In this embodiment, the nut can especially advantageously be designed in such a way that it is divided into a first section supporting against the first section of the gutter bracket in mounted state and a second section engaging with the lower groove during this. In an especially  
15 advantageous manner, the width of the nut is smaller than the length of the second section of the nut.

A nut designed in such a way can be pivoted between a free position in which it can pass under the rail during mounting  
20 and a second position in which its second section is movably extending into the lower groove and is firmly engaging with this groove when the screw is tightened. Due to the weight distribution of the nut, it will almost swing into place under the rail by itself and immediately place itself in a position  
25 ready to be fixed. Therefore, the gutter bracket can be hanged and screwed on the rail by using only one hand and without using any other aids than e.g. an Allen key.

Therefore, the detachably fixed gutter bracket can be  
30 dismounted and displaced easily and quickly merely by first loosening the nut, subsequently rotating this nut free of the rail in order to finally lift the gutter bracket off the rail.

The hook of the gutter bracket can especially advantageously  
35 be formed by bending the upper end of the first section of the



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gutter bracket so that the hook will fit over the upper groove of the rail.

5 When the hook and the upper groove both form acute angles, the gutter bracket can be clamped so hard on the rail that it cannot or only upon considerable force application can be wrenched off after mounting.

10 In a second alternative embodiment, the lower groove can be designed as a staircase with an outer edge. In this case, the nut is designed as a washer or clamping surface with a spacer. When the screw is tightened, the washer is tightened against the steps of the staircase in order to fix the gutter bracket onto the rail in a manner similar to the one in the first  
15 embodiment.

In a third embodiment, the nut according to the first embodiment can alternatively be designed with a first section corresponding to the second section so that both sections of  
20 the nut easily can pass in under the rail to engage with the lower groove of this rail. The nut can thus especially advantageously be designed with acute angles at the first and second section of the nut, which will provide a nut with a longitudinal, trapezoidal cross section. This nut constitutes  
25 a universal nut in which both sections optionally can pivot into and be journaled in the lower groove. Therefore, this embodiment is especially easy and quick to fix on the rail for the gutter fitter.

30 The rail can advantageously be made of a material selected from the group consisting of wood, aluminium or plastic, and in the two last-mentioned cases, it can be made as an extruded profile.

35 The rail can be either solid but it can also be hollow or open without thereby losing its bearing capacity. A rail with a

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hollow or open profile has a smaller material consumption and is therefore less expensive to manufacture than a solid profile. Furthermore, it is lighter to hold for the gutter fitter who is to screw the rail onto the fascia board.

5

The invention also relates to a method for mounting a gutter on e.g. the wall of a building by means of the device described above.

- 10 Methods are known in which at least one rail extending in a substantially horizontally extending direction is mounted on the building wall, the base of the roof or the fascia board, and in which a first section on a number of gutter brackets constructed of e.g. strip iron is mounted spaced apart on the  
15 rail.

- The novel and unique features of the method according to the invention, are that a hook designed at the top of the first section of the gutter bracket is lowered down over a  
20 longitudinal upper groove designed in the top face of the rail, that a nut pivotally fixed on the first section of the gutter bracket by means of a screw is pivoted into a lower groove designed in the lower face of the rail, that the screw is tightened, and that the gutter is mounted in a  
25 substantially arcuate second section on the gutter bracket.

- This method allows of quick and easy mounting of the gutter brackets. As the rail first is fixed on e.g. the fascia board, whereupon the gutter brackets are hung on the rail, all gutter  
30 brackets are easily mounted at the same horizontal level.

- In a preferred embodiment of the method according to the invention, the gutter brackets can alternatively be fixed on the rail before this rail is mounted on the building.

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By means of the device and method according to the invention, a mounted gutter can be renovated in a simple manner. Once the gutter is lifted out of the gutter brackets, the rail and associated gutter brackets can be taken down in a simple manner merely by loosening the screws with which the rail is fixed on the fascia board. This can be especially advantageous when the base of the roof is to be painted as the base will be more accessible for the operator to paint. When the gutter and associated gutter brackets are to be cleaned or washed down by means of high pressure, this can be done entirely without soiling the brickwork.

The invention will be explained in greater detail below, describing only exemplary embodiments with reference to the drawing, in which

Fig. 1 is a fractional perspective view of a known bracket iron mounted on a horizontal fascia board,

fig. 2 is fractional perspective view of a known bracket iron mounted on a horizontal fascia board,

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fig. 3 is a fractional side elevational view of the base of a roof with a first embodiment of a device according to the invention,

fig. 4 is a fractional end view of a device according to the invention where the nut is in a first rotary position,

fig. 5 is a fractional view seen in the direction of the arrow at the line V-V in fig. 3 of the nut in a tightened second rotary position, and

fig. 6 is a fractional side elevational view of the base of a roof with a second embodiment of a device according to the invention.



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Fig. 1 shows a known gutter bracket designated generally by the reference numeral 1. The gutter bracket is mounted on the fascia board 2 by means of screws 3,4 and a U-shaped fitting 5. The gutter is placed detachably in this type of gutter.

5

The gutter bracket 6 in fig. 2, which substantially corresponds to the one shown in fig. 1, has a first section 7 provided with a first tab 8 and a second section 9 with a second tab 10. The tabs 8,10 are welded onto the gutter bracket 6 and bent in over the gutter upon mounting for permanent securing of this gutter. When such a gutter is to be replaced, the tabs 8,10 are turned away from the gutter. However, the tabs cannot stand being bent back and forth several times without breaking.

15

Fig. 3, 4 and 5 are fractional views of the base of a roof on which is mounted a first embodiment of the device according to the invention. The underroof 11 is seen in the embodiment shown, said underroof is passed into the gutter 13 via drip edge 12, the gutter is hanging in a number of gutter brackets 14 of which only one is shown here. The gutter bracket 14 is supported by the rail 15 fixed on the fascia board 17 by means of screws 16.

25 The rail 15 which e.g. can be made of wood, aluminium or plastic is mounted horizontally here. By mounting the rail 15 with a pitch of a few degrees, the gutter can however advantageously be given a natural fall towards a downspout (not shown).

30

The gutter bracket 14 is designed with a first section 18 for fixing the gutter bracket on the rail 15 with screws 16, the first section passes into a substantially arcuate second section 19 for supporting the gutter 13. The rail 15 is here shown with a dovetail profile and has an inside face 20 facing the fascia board or wall, an outside face 21 facing the first

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section 18 of the gutter brackets, an upper side 22 having an upper longitudinal groove 23 having form of a face forming an acute angle with the outside face 21 of the rail 15, and a lower side 24 having a lower longitudinal groove 25 having form of a face forming an acute angle with the outside face 21 of the rail 15.

Typically, the acute angle has a size of between 20 and 70°, preferably between 30 and 45°.

10

The first section 18 of the gutter bracket 14 has a hook 26 formed by bending the upper free end of the first section 18 of the gutter bracket and engaging with the upper longitudinal groove 23 upon mounting, and also a nut 27 fastened on said first section 18 by means of at least one screw 28 and engaging with the lower longitudinal groove 25.

The nut 27 is divided by the thread axis of the screw 28 into a first section 29 supporting against the first section 18 of the gutter 14 in mounted state and a second section 30 engaging with the lower groove 25 during this. The nut width of e.g. 0.8 - 1.5 cm is advantageously smaller than the length of its second section 30. The total length of the nut is for example two or three times the size of the nut width. As seen best in figs. 4 and 5, the nut will thereby pivot of itself between the free position in fig. 4 in which it can pass under the rail 15 at mounting, and the second position in fig. 5 in which the second section 30 of the nut is extending movably into the lower groove 25 and is firmly engaging with this groove when the screw 28 is tightened.

Figs. 4 and 5 also show that the gutter bracket 14 with the hook 26 is catching the upper longitudinal groove 23 of the rail 15 and that the nut 27, which here is pivoted 90°, is engaging the lower longitudinal groove 25 and is clamping the

first section 18 of the gutter bracket 14 into abutment against the rail 16 upon tightening of the screw 16.

5 In fig. 3, the substantially arcuate second section 19 of the gutter bracket 14 is ending at its free end in a bent edge or tab 31 serving for keeping the gutter in place in the gutter bracket, the gutter being kept into abutment at the first section by a bow 32 designed on the gutter bracket. Therefore, the gutter bracket can be utilised for different known  
10 gutters. Alternatively, the gutter bracket can be designed with different means for keeping the gutter in place in the gutter bracket. Such means can for example be the tabs 8,10 shown in fig. 2.

15 Fig. 6 shows a slightly modified embodiment of the device according to the invention and the same reference numerals are used for like parts.

The gutter bracket 14 in fig. 6 does not have, as the gutter  
20 bracket 14 in fig. 3, a bent edge or tab 31 but is resting freely in the gutter bracket in which it for example can be retained if necessary by means of a few, not shown, evenly distributed clamps fitted over the free, outwardly facing edge. However, it is only rarely necessary to use means for  
25 retaining the gutter in the gutter bracket as the gutter due to the exact and uniform mounting of the gutter brackets will not shift once they have been mounted.

In fig. 6, the rail 15 is designed with a lower groove 33 in  
30 form of a staircase having an outer edge 34. In this case, the nut 35 has form of a washer 36 with a threaded spacer 37 which receives the screw 28 so that when the screw 28 and spacer 37 are tightened together, the washer 36 will be tightened into close abutment against the outer staircase edge 32 and secure  
35 the gutter bracket 14 on the rail 15.

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In the drawing, the rail is shown as a solid profile which for example can be made by extrusion. However, the invention is not limited to solid profiles but can also be hollow and therefore lighter and less expensive than a solid profile  
5 within the scope of the invention.

The gutter brackets can be made of a hard plastic such as a polycarbonate or can be made of a metal such as strip iron which is strong and inexpensive.

10

An especially exclusive embodiment of the invention is obtained when rail and gutter bracket are made of the same material such as e.g. aluminium or a hot-galvanized steel meeting Danish Standard No. DS 1461.

15

Gutter bracket made of aluminium or galvanized steel has the advantage of being seawater-resistant and therefore can be utilised even in salty areas. They do not frost-burst and will therefore not become skew. Only a relatively small number of  
20 gutter brackets are needed to ensure stable mounting of the gutter, and such gutter brackets can therefore typically be mounted with a spacing of between 50-60 cm.

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Patent claims

1. A device for mounting a gutter (13) on a building and comprising
- 5       - at least one rail (15) mounted on a wall or fascia (17) and extending in a substantially horizontally extending direction,
- 10       - a number of spaced apart gutter brackets (14) made of e.g. strip iron and each having a first section (18) for fixing the gutter bracket (14) on the rail (15) and a substantially arcuate second section (19) for supporting the gutter (13),
- 15       - said rail (15) having an inside face (20) facing the wall or fascia (17), an outside face (21) facing the first section (18) of the gutter brackets (14), an upper side (22) having an upper longitudinal groove (23), and a lower side (24) having a lower longitudinal groove (24), and
- 20       - the first sections (18) of the gutter brackets (14) are each provided with means (26,27) for detachably engaging the grooves (23,25) of the rail,
- characterised in**
- 25       - that the means (26,27) for detachably engaging the grooves (23,25) of the rail comprise a hook (26) designed at the top of the first section (18) of each gutter bracket (14) and engaging with the upper groove (23) at mounting, and a nut (27,35) secured on said first section (18) by means of at least one screw (28) and engaging with the lower groove (25).
- 30
2. A device according to claim 1, **characterised** in that the upper groove (23) has form of a face forming an acute angle with the outside face (21) of the rail (14).
- 35 3. A device according to claim 1 or 2, **characterised** in that the lower longitudinal groove (25) has form of a face



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forming an acute angle with the outside face (21) of the rail (14).

4. A device according to any of the claims 1, 2 or 3,  
5 **characterised** in that the lower longitudinal groove (25) is designed as a staircase having an outer edge (32).
5. A device according to any of the claims 1 - 4,  
10 **characterised** in that the nut (27) is divided by the thread axis of the screw (28) into a first section (29) supporting against the first section (18) of the gutter bracket (14) in mounted state and a second section (30) engaging with the lower groove (25) during this, and that the width of the nut (27) is smaller than the length of  
15 its second section (30).
6. A device according to any of the claims 1 - 5,  
20 **characterised** in that the nut (27) is designed in such a way that it can pivot between a free position in which it can pass under the rail (15) at mounting, and a second  
position in which its second section (30) is movably extending into the lower groove (25) and is firmly engaging with this groove (25) when the screw (28) is  
25 tightened.
7. A device according to any of the claims 1 - 6,  
30 **characterised** in that the hook (26) of the gutter bracket (14) is formed by bending the upper end of the first section (18) of the gutter bracket (14).
8. A device according to any of the claims 1 - 7,  
35 **characterised** in that the rail (15) is made of a material selected from the group consisting of wood, aluminium, galvanized steel or plastic.

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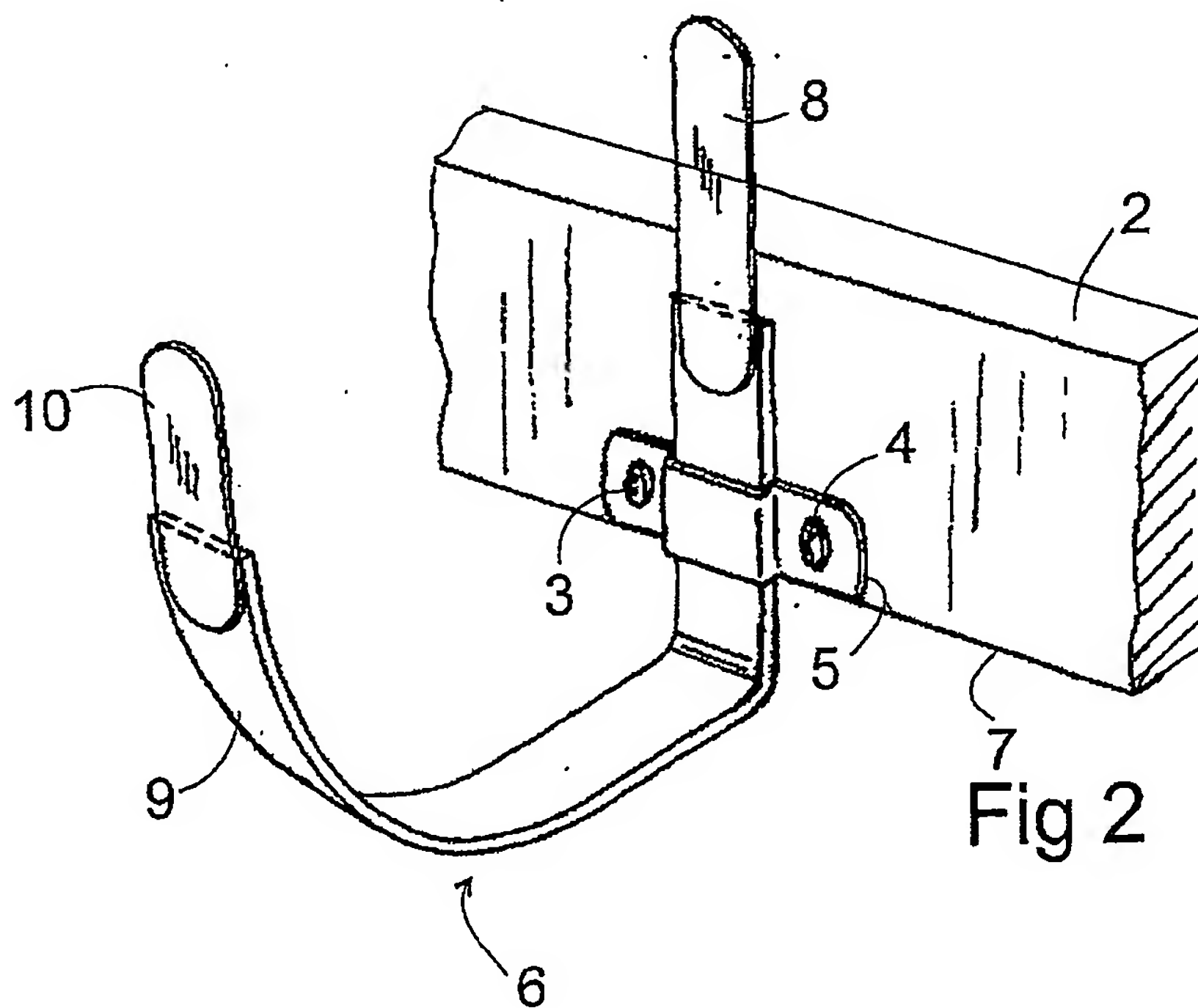
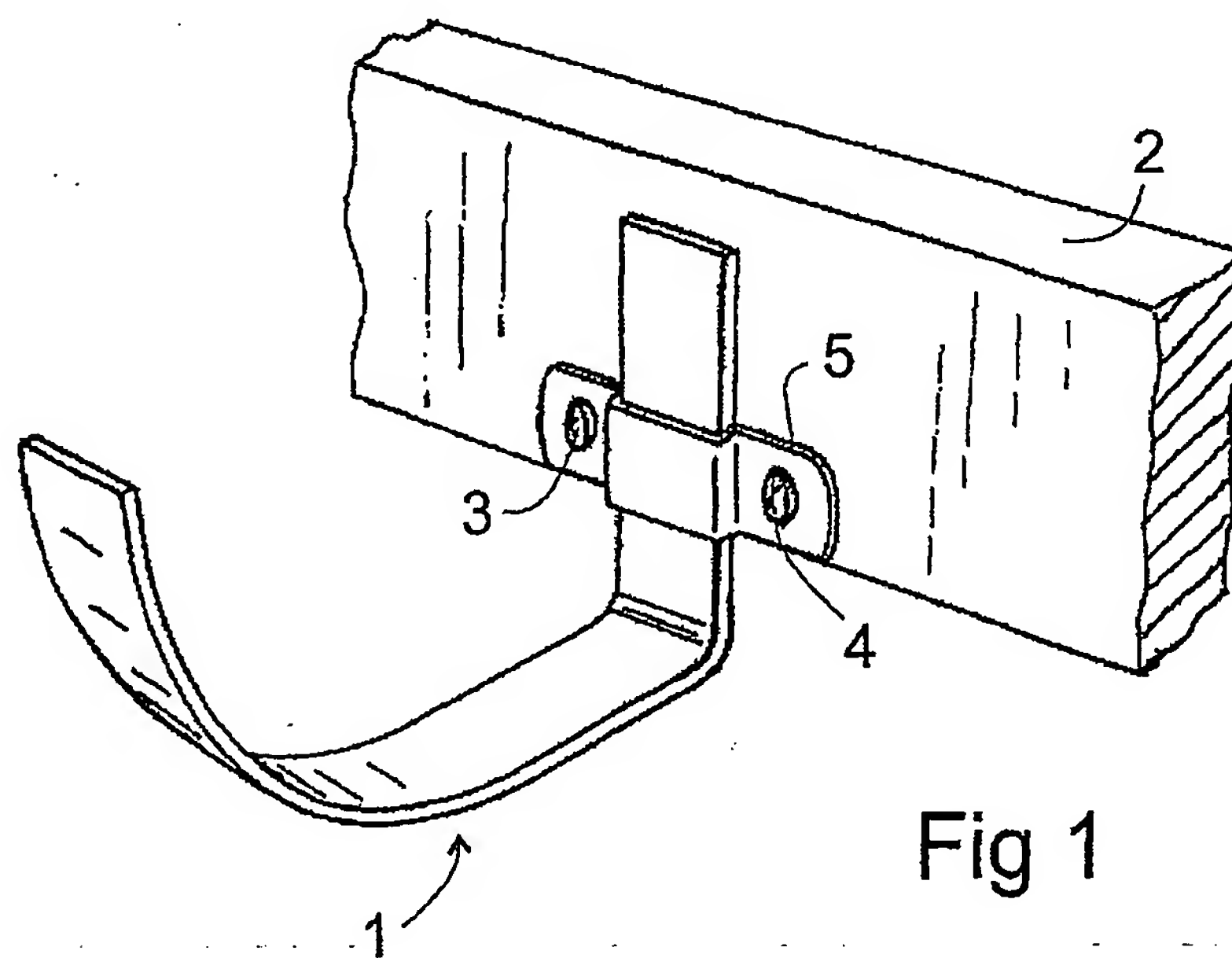
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9. A method for mounting a gutter (13) on a building by means of the device in claims 1 - 8 and comprising the process steps of

- 5       - at least one rail (15) extending in a mainly horizontally extending direction being mounted on the wall or the fascia (17), and
- a first section on a number of gutter brackets (14) made of e.g. strip iron being fixed at a distance from each other on the rail (15),

10       **characterised in**

- that a hook (26) designed at the top of the first section (18) of the gutter bracket (14) is lowered down over a longitudinal upper groove (23) designed in the top face of the rail (14),
- 15       - that a nut (27,35) pivotally mounted on the first section (18) by means of a screw (28) is pivoted into a lower groove (25) designed in the lower face (24) of the rail (15),
- that the screw (28) is tightened, and
- 20       - ~~that the gutter (13) is mounted in a mainly arcuate~~  
      second section (19) on the gutter bracket (14).





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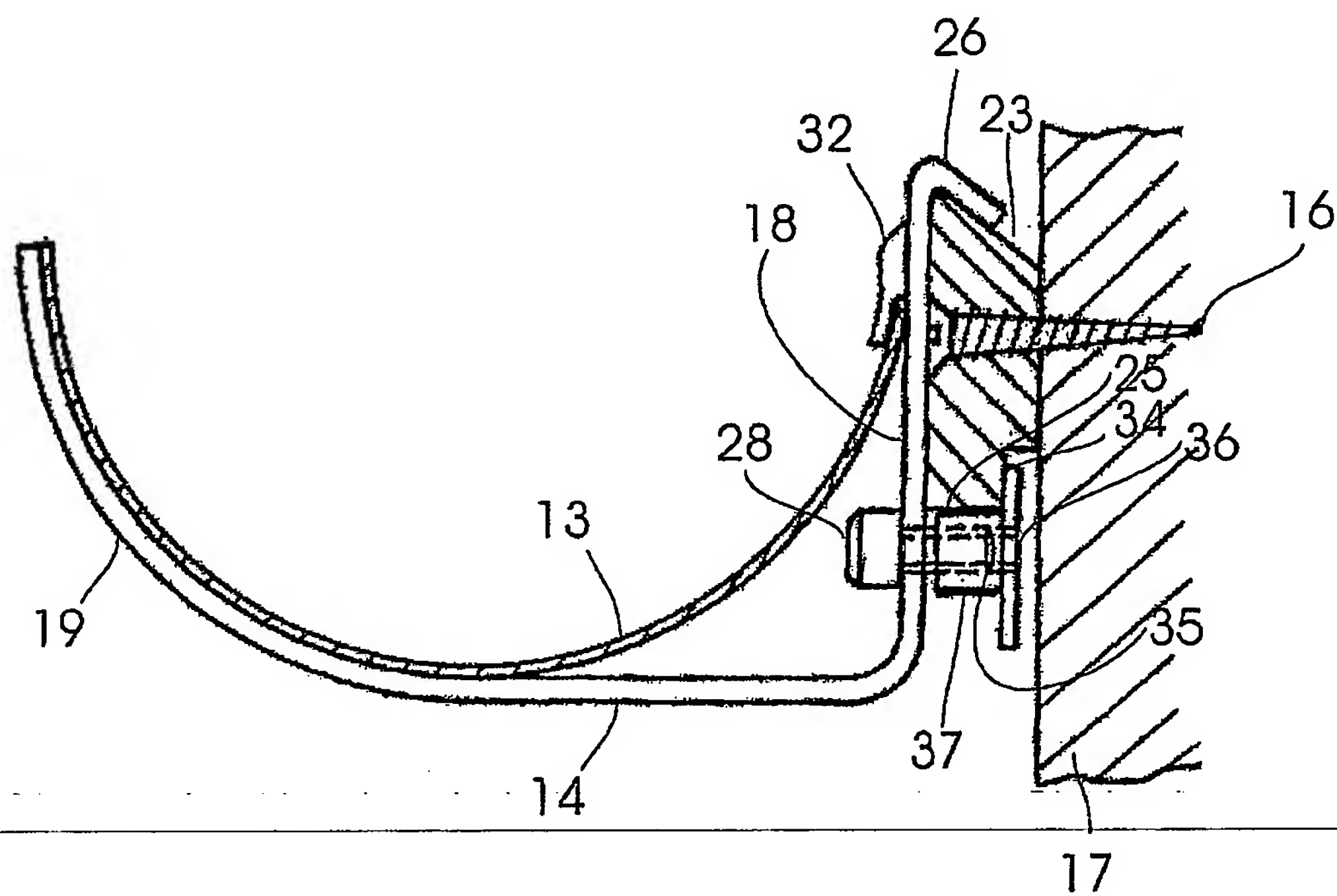


Fig. 6



## INTERNATIONAL SEARCH REPORT

International application No.

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: E04D 13/072

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: E04D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	JP 10131432 A (SEKISUI CHEM CO LTD), 19 May 1998 (19.05.98), see Patent Abstract of Japan JP 10131432 A and figures --	1-9
A	JP 09302869 A (MATSUSHITA WORKS LTD), 25 November 1997 (25.11.97), see Patent Abstract of Japan JP 09302869 and figures --	1-9

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

06/07/02

International application No.

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